

Gemini

a publication of the Minnesota Astronomical Society



<http://www.mnastro.org>

DECEMBER
1 9 9 9

volume
24

number
6

Upcoming Events

December

- 2 Pluto is at conjunction, behind the sun.
Mercury is at greatest western elongation, farthest up, 20 deg, in the morning sky.
- 3 The Moon passes 3.0 deg N of Venus; morning sky.
- 5 The Moon passes 3.0 deg N of Mercury; morning sky.
- 11 The Moon passes 0.07 deg N of Neptune; evening sky.
- 12 **The Moon passes 0.6 deg N of Mars; evening sky.**
The Moon passes 0.2 deg N of Uranus; evening sky.
- 14 Mars passes 0.7 deg S of Uranus; midnight
Geminid meteor shower peaks before dawn.
- 17 Mercury passes 5.0 deg N of Antares, morning sky.
- 18 The Moon passes 4.0 deg S of Jupiter, evening sky.
- 19 The Moon passes 3.0 deg S of Saturn, morning sky.
- 21 The Moon passes 1.3 deg N of Aldebaran, evening sky.
- 22 The Winter Solstice – the first day of winter; 0200.

January

- 2 The Moon passes 3.0 deg N of Venus; morning sky.
- 4 **Quadrantid meteor shower peaks; before dawn.**
- 10 The Moon passes 1.9 deg S of Mars; morning sky.
- 15 The Moon passes 3.0 deg S of Saturn; evening sky.
Mercury is at superior conjunction, behind the Sun
- 17 The Moon passes 1.2 deg N of Aldebaran; evening sky.
- 20 **Total Lunar Eclipse.**
Totality starts at 2102. Maximum at 2244.
- 24 Neptune in conjunction with (behind) the Sun.

Points of Interest:

- Planets: Mercury:** Libra-Ophiuchus. High in the morning sky, behind the Sun by month's end.
- Venus:** Virgo - Libra. Blazing crescent in the morning sky, lower by month's end..
- Mars:** Capricornus. Getting lower and dimmer in the early evening sky.
- Jupiter:** Pisces. Rules the night. Bright in the South.
- Saturn:** Pisces - Aries. A little behind and fainter than Jupiter.
- Uranus:** Capricornus. To the Southwest after sunset.
- Neptune:** Sagittarius. Setting in the early evening sky, before Uranus.
- Pluto:** Ophiuchus. Behind the Sun.

Check out the Northern Lights!! As we approach the Solar Maximum in the year 2000, activity on the sun will increase. That means we'll see more and more aurora here on Earth!

Minneapolis Planetarium: 630-6150

Holiday Schedule

Tis the Season: Sat and Sun at 1300 & 1530, Thurs. at 1900. Until Jan. 14th. Extra showing for the Holidazzle Parade through December: Fri. & Sat. at 1730.
A Christmas Present: Sat at 1100 & 1415 and Sun at 1415. Until Jan. 14th.
1st Monday of the Month: **SkyWatch**, 1200.
1st Wednesday of the Month: **SkyWatch**, 1900.
Romancing the Stars: December 11th and January 8th, 1900.
Star Light, Star Bright: A special show for preschoolers. January 29th, 1100.

Winter Shows Starting January 15th

Max's Flying Saucer: Sat. and Sun. at 1300 & 1530.
The X-traterrestrial Files: Sat. and Sun. at 1415.
Thurs. at 1900.

Eisenhower Community Center Observatory

Open for viewing for about 10 days each month.
Call for reservations: **612-988-4077**. Night sky tours for the general public with a 12-inch reflector on the rooftop in Hopkins.

University of Minnesota:

Observing from the telescope on top of the Physics building, East Bank. Open to the general public.
Fridays during the school year: **612-626-0034** for more info.

MAS Star Parties:

The Minnesota Astronomical Society hosts star parties, open to the general public. Come on out, get a look through a telescope, enjoy the view, get connected with the local astronomical community. They also have a monthly meeting covering a variety of astronomy topics, also open to the public. Call **651-649-4861** for more info or log-on to the web at www.mnastro.org.

Editor

Jean Fideler

Editor Pro Tem

Thor Olson

Circulation

John Treadwell

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**Minnesota Astronomical Society
Board Meeting Minutes
August, 24, 1999 at Southdale Branch
of Hennepin Libraries**

Minutes of previous meeting read and accepted.

No Treasurer report, wait for Quarterly report at end of September.

Gemini report by Thor Olson; August issue put out by Thor. Thor also offered to do next issue. Content for future issues was also discussed.

Outreach report, John Treadwell and Dave Runkel had a meeting with about 50 Girl Scouts at the Onan Observatory. There is a planned meeting of Outreach at Como Park, St. Paul next Saturday

The loaner scopes are in still in the possession of John Treadwell and reported that the collimator had been borrowed. (George Skinner)

Cherry Grove report was given by Bob Schmidt who was advised to go ahead with project as outlined in the report.

Former Member Marion Warling has offered to put his 14-inch scope available for use by the Minnesota Astronomical Society.

It was reported that blue reflectors were placed at the driveway to the Metcalf observing site to help visitors find the gate.

Onan report; The arch not yet here. The entrance doors and the door to Baby Bear are installed.

Thor will check with Ron Schmit on the status of the badge maker.

A lengthy discussion was held concerning the planned Anniversary event. A motion by Bob Schmidt was made to allocate \$200.00 to cover expenses for the event. Seconded by Thor Olson. Motion passed.

Operating expenses for the Onan Observatory for the year 2000 was discussed. This will have to be handled in the budget for next year.

**September 7, 1999 Regular meeting
of the Minnesota Astronomical
Society. Held in room 170 of Tate Hall
Physics Building of the University of
Minnesota.**

Meeting called to order at 7:31 PM by Vice President Gibson Batch.

Mr. Batch introduce our speaker, Dr. John Winckler, Physics Professor Emeritus who talked about his experiments in the study of Aurora Borealis.

Announcement was made concerning the 25th Anniversary celebration to be held at the Onan Observatory on Saturday, September 25, 1999.

The next meeting will be at the Minneapolis Planetarium with Planetarium staff talking about the recent total eclipse of the Sun.

We should expect to be back at the Science Museum of Minnesota sometime soon after their new building is opened.

Thor Olson will be acting Editor of Gemini.

Bill Glass announced that Astronomy is available to MAS members at the special price of \$31.00 when ordered through him. Deadline Sept. 30, 1999.

Mike Connelly reported on the Larson telescope and said that there is still a bit of tweaking to be done before it is ready to install in the Onan Observatory.

Dave Olmstead gave a report on progress on the Onan Observatory and that there is a need for people on weekends to put in work.

Gibson Batch announced that he needs members to volunteer for positions on the Executive Board. Open positions are Vice President, Treasurer, and Board Member at Large. Term is two years.

George Skinner has the laser collimator.

Bob Schmidt announced that Dave Sjogren deserves a big thank you for cutting the grass at Cherry Grove.

Ben Huset gave his monthly report on Space Happenings and reported that the Mars probe is to land on Dec. 3, 1999. Also reported was the 8% cut of NASA funding.

September 21, 1999 meeting of the Minnesota Astronomical Society Board held at Perkins Restaurant.

Minutes of previous meeting read and accepted.

Third quarter Treasurer report will be available after Sept. 30, 1999.

Gemini report: October issue is printed and ready for labeling. John Treadwell will put it to bed. Stories and pictures of the 25th anniversary will be needed for the next issue.

Web report: Thor Olson declared that Bill is doing really well as webmaster.

Library report: Patti has received an offer of books for the library.

The general meeting for October will be at the Minneapolis Planetarium and November and December will be at the University of Minnesota.

Outreach will need copies of Gemini and other MAS handouts at the 25th Anniversary event.

Loaner Scopes: One is out to new member Jeff Solomon.

The Onan / Baylor anniversary plans are under way, the Park Staff is going

all out, providing chairs and other supplies, doing cleanup and more.

Cherry Grove: Dave Sjogren put in nearly the equivalent of a full day cutting the grass and cleaning up the area. Thanks Dave!

Metcalf: Reflectors are in at the gate. This should be put in Gemini directions to the site. Also on the "Hot Line" on Metcalf star party nights.

Outreach flyer: A new one is needed. Jean Fideler had one started but it is now lost.

Gibson Batch is planning to make a "History" booklet of the Minnesota Astronomical Society, a listing of articles to be written by members of MAS. This could be a fundraiser for MAS.

A target figure for annual expenses for Onan Observatory was discussed and suggested about \$750.00 total, allocated \$400.00 general, \$175.00 insurance, and \$180.00 electricity.

Gibson Batch reported on his efforts to get candidates for the upcoming annual election.

October 5, 1999, regular meeting of the Minnesota Astronomical Society.

The meeting was held at the Minneapolis Planetarium at the Minneapolis Public Library in downtown Minneapolis.

The program for the evening was given by Bob Bonadure of the Planetarium staff and by MAS member Ron Schmit. Their presentation was a report with pictures and videos of their trip to the Black Sea and to Turkey to view the total eclipse of the Sun.

Following the program a demonstration of the Planetarium Star Projector was given.

Ron Schmidt reported that he is delivering the badge maker to Paul

Wright after the meeting

President Ben Huset concluded the evening activities with a brief space projects update.

Robert H. Schmidt, Secretary

#1: Introduction

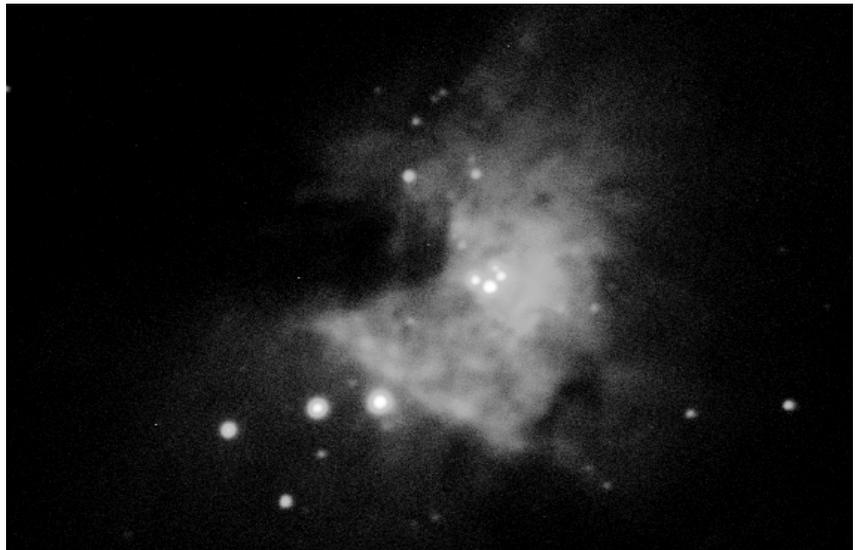
My first thought, upon sitting down to start this submission, was... 'oh brother, where do I begin'. Then I thought, 'well that's the whole point!' It's almost impossible, given the complexity surrounding digital imaging, to know where to begin.

I immediately started to think about the questions that ran through my head when I first decided to pursue the CCD Astronomy hobby. What do I look for in a camera? What can I afford? Will my time, money and effort be well spent if I'm starting from ground zero? Am I patient enough to get through it? Is there a way to start slow and work my way up to creating images like the ones I see in journals and magazine articles? Do I have enough computer hardware and software where-with-all to get by? Why do I want to do it at all?

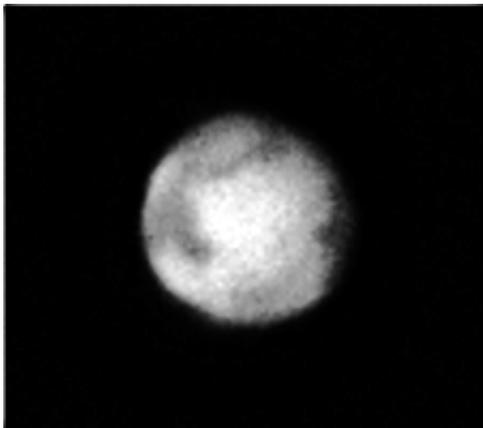
To address the last question first, I'd always thought that the pictures of planets, stars and galaxies I'd seen in magazines, physics texts, and science journals were just plain beautiful. Even though most of those images were taken by professional astronomers in the name of hard science and research, my personal goals revolve around how wonderful it would be to be able to

produce images like the pros myself. It would be wise, for starters, to ask yourself the 'why do I want to do it at all' question before you go out and buy anything! If you get past question one and are still as excited about moving forward, the next question to ask yourself is 'can I start slow and work my way up while still enjoying the results I can get with the equipment I've already got?'. In my experience the answer is a definite "yes!".

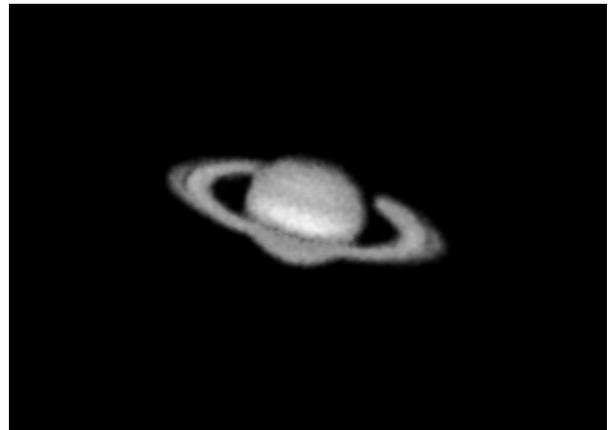
I figure in the ranks of the amateur astronomers reading this that only a few are interested in doing imaging for scientific research. And if you are one of them, then you probably already know more on the subject than I do. For the rest of you, I hope that sharing some of my experiences, mistakes, and results will help you make the best start that you possibly can, and keep you on the right track as we head toward our mutual goal of becoming proficient at CCD imaging.



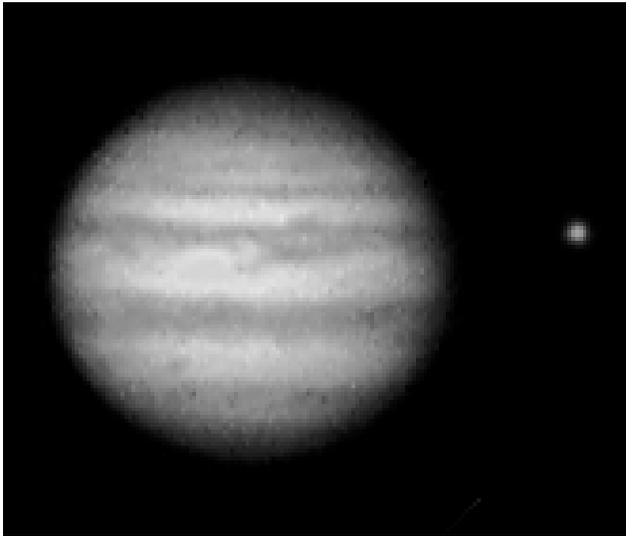
The Orion Nebula, M42



The 16 arcsecond disc of Mars at its close approach, May 1999



Saturn as it approaches its best viewing, summer 1999



Jupiter clearly showing its Great Red Spot in the summer of 1999.

CCD photos and article from MAS member Gary Smith.

For this first submission, I'm including some of the work from my first year of attempts to use my camera and equipment efficiently. Enjoy them... let me know what you think! Please submit any feedback to me at gcmith@aol.com. I'd really enjoy hearing from other amateurs interesting in tackling this challenging endeavor,

whether the feedback is critical or complimentary, or you just have a question about choosing and using the gear.

If there is an interest, I'll submit a follow up installment on... "The right camera to suit your budget and needs" in the coming months.

MAS Elections

Gibson Batch, Election Chair

Elections for MAS officers and board members will be held at the December meeting (Dec 7, 1999). Here are profiles of the candidates:

John Connery (running for Membership Chair) joined the MAS in 1986 and has served previously on the Board for two terms at Member-at-Large. He was active with early decisions concerning the Onan Observatory project, and has been recently working to maintaining and improving the Cherry Grove Observatory. He has made several of his own telescopes and is interested in solar eclipses and general observing of the night sky.

Chuck Jorgensen (running for Treasurer) has been with the MAS since 1997, the same year of his retirement as a cardiologist at Abbott-Northwestern Hospital. He is interested in general astronomy as providing real world flavor to the many astrophysics classes he has been auditing at the U of Mn Astronomy Department. He has been actively participating on the construction of the Onan Observatory.

David Olmstead (running for Vice President) joined the MAS in 1996. He presently has an interest in CCD observing and general viewing of the night sky. He is presently heading up the Onan Observatory construction process for most of last year, and has served the MAS well by provided leadership for this difficult task. He has also helped with MAS outreach events. David is interested in seeing more club participation at construction and outreach projects, making sure a good time is had by all.

Editor's note: A recent posting to the MAS e-mail list brought us up to date with the construction activities on the Onan Observatory. It is reproduced here for the members who do not subscribe to the e-mail forum, and to acknowledge the work and dedication of these active members.

Subject: MAS: Onan Work Report and Comments.

Date: Mon, 27 Sep 1999
17:31:10 -0500

From: David Olmstead
<david@davidolmstead.com>
Reply-To: mas@mnastro.org

Hi all,

Since I usually report on the weeks work progress, I thought, even though there has been much talk about the success of the party on Saturday, that I would report on the work accomplished this past Saturday, before the party started.

We finally attached the hardware on the Dutch doors. A bit of fussing went into the doors but they are slick. We kind of took it easy most of the day but we did move scaffolding out of the building to make it presentable to the large crowds that showed later.

Dave Runkle and Bob Brose unloaded a monstrous cabinet that will be used for the computer and monitor that will ultimately control the scope.

You have to see this piece of equipment! The weather proof, bomb proof heavy

steel unit is typically used in submarines! Completely sealed and climate controlled with air conditioning and heater, the cabinet has back up power and must weigh close to 400 pounds. Dave's company, Zeiss, pretty much donated it. It is worth thousands but evidently the gray color didn't go with their blue color scheme! It is a technical thing that I don't fully understand. Real cool!

We rolled the roof back for the first time in a year or so. It was a big moment for us. After the party, while attempting to close it, we discovered that we need to make some adjustments to the roller brackets. We did close the roof with the use of a wrench to make some temporary adjustments but we will need to revisit these issues after the door is installed and our final roof configuration has been established.

After the party the skies cleared and the work crew enjoyed the balmy evening looking through Dave R's scope. A good work day and wonderful party and post party!

We will be shooting for this coming Saturday again. Always something to do and I will keep you all up to speed as the week rolls on.

Since it is my turn in the hot seat this year as far as work management goes, I wanted to say a few words about our crew this year. These folks deserve recognition and since I know their contributions first hand, I think it fitting that I ramble on here a tad.

First off I want to thank

Gibson and those involved in the party for their hard work spotlighting the Observatory and club to the public. I think that the ceremony was terrific!

I should have stepped up to the mike to mention the guys but I am not the best in front of a mike and I would not have been satisfied with five minutes of air time. It would have taken me that long to clear the frog from my throat.

About the crew. They are wonderful, hard working guys. Let me tell you all a little about them.

Ralph Nelson - What a nice guy. Not only did he design our new building but he is a real hands on fella. He has sweat, clawed and grunted with the rest of us and walked away each day with dirty hands and problems to think about. He has spent nearly every Saturday this summer working with us and has given us the glue and vision to get through this thing. I can't say enough good things about Ralph.

Dave Runkle - Not only is he traversing the countryside on behalf of the club as our Outreach Guru but he also spends oodles of energy working on site. Dave, along with Bob Brose are responsible for getting our telescope mount repainted, picking up the large arch assembly and countless other tasks. Dave will be concentrating on the assembly and controls for the telescope, a task which he says is his strong suit. The truth is he probably understands the building better than any of us.

John Treadwell - John is a rock of a guy. Always

available, passionate about the project and as regular as the Sun. I'm talking about his work! John spent hours sawing bricks for the plaza area. I don't know how many bricks he cut but he was white with concrete dust at the end of those days. John has put in a ton of time. Easy to work with and a new friend of mine.

Bob Brose - I mentioned Bob earlier. I guess Bob has been with the club since the beginning, which is amazing since he is only about thirty years old or so! I'm not sure how that works. Bob along with these other guys has been involved with this project long before I came on the scene and is a hard working fun guy to be with. If anyone scratches the mount, you will have to answer to Bob!

Dave Sjogren - Boy does this guy work! He puts us all to shame. From enclosing the building, helping prep the floor for concrete, and virtually single-handedly fixing up the grounds around the building, he has spent days out there. The list goes on and on. Dave also has the most muscular abdominal muscles of all of us, for which we hate him, since most of us are his junior.

Chuck Jorgenson - I hope that I spelled your name right Chuck? Chuck is a retired cardiologist by trade. He is used to more delicate work, but we have him mixing concrete, pounding in bricks and ratcheting down nuts. He never complains and has a relentless work ethic. He patiently waits for us to get off of our rears and get back from our breaks. Super guy!

Bill Glass - The "Pretzel Man" and "Master of the Money." Bill is the "Sun Dude." Bill has been such a joy to work with. Even with a soft cast on his wrist he works hard and keeps the conversation going. When he is in town and not traveling the world in search of the perfect solar eclipse he is right here in River City helping out at Onan. We have had some good times together.

Many others have donated their time and worked hard for this vision. I will attempt to name a few, but I know that I will screw up and leave some out.

John Connery, Bob Schmidt, Ben Huset, Gibson, Don, Wayne, Todd, another Chuck a few more Bobs and Mikes. All of these folks have spent time on the Rock pile with us and need to be mentioned. Thanks to all of you!

I think that I am out of ink here. I am real proud of the crew we have had pounding away at this project. Well done, and we will continue. I wanted the club to get to know of their contributions.

As for me, I am not sure how long I can stay as focused on this endeavor, for I have a career and family that need some time too. I'll hang in there and when my time is running out I am sure that someone else will step up to the plate and have a go at it. That is the way this project has gone from the beginning.

We hope to see you on a Saturday.

Dave O.

Just about every posting to the MAS e-mail list gets a response, and this one was no exception. Here's an addendum by Bill Glass:

Subject: Re: MASBOARD: Onan Work Report and Comments.

From: "William H. Glass" <glass@mgi.com>

And of course, I'd like to say "thank you" to Dave - he's kept the project rolling this year and I hate to think of the number of hours that he's spent working on the observatory.

Also, Dave left out an important group of people - the wives and families of all those guys who have spent so many weekends working at Baylor. I'm sure that the work parties have interfered with ordinary home life for many people and I'd like to say thank you to all those wives who were willing to part with their husbands for so many Saturdays.

Bill

If you would like to subscribe to the MAS e-mail list and participate, or just listen in to the forum, send e-mail to:

mas-request@mnaastro.org

with the single line

subscribe

in the body (not subject) of the message.

On a recent visit to Arizona, I decided to spend a day at Mount Graham near the town of Safford. Mount Graham is the home of three relatively new astronomical observatories that showcase some of the new techniques being used today.

Unfortunately, Mount Graham is also the home of the red mountain squirrel which is an endangered species. Apparently, this species lives nowhere else in the world except near the top of this mountain in an environment called a "sky island" because of its isolation due to high altitude. For several years, the environmental community attempted to stop construction of the observatories in order to preserve the habitat of the squirrels. Today, an uneasy truce seems to exist among the various feuding factions. In order to protect the squirrels, the Forest Service has closed the top of the mountain above 10,000 feet to all access. The University of Arizona (which operates the observatories) has been granted an exclusion to allow them to access five acres of land. The boundaries of this area have been carefully drawn to include the single lane access road (3 acres) and the observatory buildings (2 acres). In many places, the boundary fences are within 10 feet of the buildings. Fences surround the protected habitat and warning signs are posted at frequent intervals. The regulations are so tight that the construction workers aren't even allowed to eat lunch outdoors because they might accidentally drop food crumbs that would

attract the squirrels. Many of the local residents are upset with the astronomers because they blame the observatory project for bringing in the environmentalists and the resultant closing of the mountain top where they used to go hiking and hunting. The Forest Service is caught in the middle and of course finds it impossible to do anything without upsetting at least one of the groups.

When the construction finally started several years ago, plans were made for a Visitor's Center in the town of Safford. When the local mayor got behind the project, it grew into something larger and eventually became known as Discovery Park. Today, Discovery Park consists of a small astronomical and space museum with a 20" telescope for public viewing. Outdoor exhibits on the history of mining, the history of Arizona, and local wildlife are under construction. A miniature railroad with 2 miles of track has been built to transport visitors around the grounds.

Last year, Discovery Park began offering tours to the observatories on Mount Graham. Before then, it was impossible for the public to gain access to the site, and even today, it is very difficult to get there except on the tour. The tours are run only on Saturdays, are limited to 13 people and cost \$30 per person (a lunch is included). As one might expect, the tour is aimed primarily at people that have only a casual interest in astronomy and

isn't very technical. Still, I wanted to see the site and made a reservation about a week in advance to go on the trip.

The tour begins with the 26 mile long drive up the Mount Graham road. This road was built by the state over 50 years ago and its existence was one of the reasons for choosing this site to build the observatories. Most of the road is paved and even the dirt sections are easily passable for a normal passenger car. Near the old Columbine work camp at roughly the 9,500 foot level, you leave the state road and pass thru a locked gate to gain access to the single lane road going to Emerald Peak which is the location of the observatories (elevation 10,413 feet). Security personnel from the University of Arizona and the state of Arizona are present to keep out unwanted visitors.

Our first stop was the Vatican Advanced Technology Telescope (aptly nicknamed the "Pope Scope"). This is a 1.8m optical telescope of the Gregorian Cassegrain design. The primary mirror is f/1.0 which makes the scope very compact and the building to house it is quite small. The mirror was made at the spin casting facility at the University of Arizona. Many of the technical details of the observatory can be found at <http://clavius.as.arizona.edu/votatt.html>. I happened to visit on the day of the full moon and as a result the building was completely deserted - even the small dormitory

was empty.

Our second stop was the Henrich Hertz Submillimeter Telescope. This 10m scope is designed for receiving microwaves in the 0.3 to 1.0mm wavelengths. The primary mirror is made of a carbon reinforced plastic material and is claimed to have the most accurate surface ever made in a scope of this size for receiving microwaves. The incoming beam is split among several detectors, all of which are cooled with either liquid nitrogen or liquid helium. The most sensitive detectors operate at temperatures only a few thousandths of a degree above absolute zero. More technical details about the scope can be found at <http://maisel.as.arizona.edu:8080/smt.html>.

While we were there, a grad student from the University of Arizona was attempting to do some useful work, but finally gave up because the humidity was getting to be too high to receive the wavelengths in which he was interested. So, he gave us a demonstration of how the scope operates and moves. The scope is on an alti-azimuth mount and the upper part of the building rotates with the scope. Two giant doors open in the front of the building and two small doors open on the roof to permit the scope to see out and point up into the sky. While rotating the building, the large doors frequently hit tree branches and I commented that it looked like a little pruning was needed. The grad student informed me that the University wasn't allowed to do that. Since the trunks of the trees were in the area protected for the red squirrels, the

University isn't allowed to alter those trees, even though they overhang into the space allowed for use by the observatories.

The final stop was the Large Binocular Telescope. This observatory is still under construction and completion is still several years away. The telescope will contain two 8.4m mirrors that will be made at the spin casting facility at the University of Arizona. The mirrors will weigh 15,600kg each. Before they can be transported up the mountain (they're too heavy for helicopters), at least one bridge on the Mount Graham road has to be rebuilt. One of the interesting aspects of the design of this telescope is the method that will be used for re-aluminizing the mirrors. Rather than removing the mirrors from the telescope, the re-aluminizing will be done without moving the primary. A special vacuum container has been designed to fit on top of the mirror so that the process can take place directly on the scope.

The building housing the LBT is 16 stories tall and can easily be seen from the town of Willcox - about 50 miles away. An alti-azimuth design is being used, with the upper half of the building rotating while the lower half remains stationary. An Italian observatory is heavily involved in the project and much of the metal work of the building was built in Italy. Ohio State University and the University of Arizona are also major participants.

After returning back to Safford (it's an all day trip up to the mountaintop and back down), I got

a chance to visit the Gov Aker Observatory at Discovery Park. Because of the full moon, the observing was lousy and only a small handful of people were present. We were able to look at only a few bright objects (e.g., the Moon, Jupiter, Saturn, and a couple of bright stars). The 20" cassegrain scope was originally at Kitt Peak before it was donated to the observatory. It's a very nice scope and the museum staff hopes to get it to be computer operated in the near future. The observing programs are run by members of the local astronomy club, but they don't even get any observing time in return for the work - the scope is used only for the public programs.

All in all, I found it to be a very enjoyable day. If you ever find yourself in Safford Arizona on a Saturday, I heartily recommend that you drop by Discovery Park and get the Mount Graham tour.

Bill Glass

New Members

Bruce A. Berghoff

Sofia Chavier

Sarah E. Diebel

Troy Eagen

Norm Glock

John Hart

Barry R. Jensen

Don Koch

Scott Lehman

Gerald L. McDougal, Jr.

Matt Orton

Rick Richardson

Jeff Solomon

James A. Sorensen

Kimberly Stafford

Mark Berg

Steven Viltoft

Sue Vital

For Sale: Telescope w/ mount

Tele-Vue Pronto, 70mm w/ 2" diagonal and Losmandy GM-8 w/ polar align scope. Accessories: 55mm, 40mm, 32mm, 11mm, all Possl by Tele Vue, and many other astrophoto items, too many to list here. Sell individually or separate. Call: Richard Johnson at 612-938-2461 or rosierichard@email.msn.com

For Free:

I've got between 60-80 back issues of Astronomy and Sky & Telescope that I've decided to part with. Most are in very good condition and all are complete. Some issues are missing. The magazines date back to about mid '93. The older ones are mostly Astronomy with the more recent stuff being S&T. Does anyone know of a school or hospital or something like that where this accumulation might be appreciated or put to good use? If anyone can provide a good home to these old friends, contact me soon. They're free but you've got to take 'em all. Steve Olson 612-542-1883

Metcalfe

Metcalfe is the grassy parking lot of Metcalfe Nature Center, about 20 miles east of St. Paul along highway 94. About 6 miles E of the 694/494 crossing is county road 15 (Manning Ave.). Turn right, then left onto the frontage road and continue east, crossing over county road 71. Turn right (south) onto Indian Trail; follow it 1.1 miles to an chicken-wire gate on the right, (marked by three blue reflectors), opening onto a dirt driveway, which is the entrance to Metcalfe.

Baylor Regional Park

Baylor Regional Park is roughly 25 miles W of the SW corner of 494. Head west on highway 5, through Waconia, to Young America. Turn right onto county road 33 and follow it about 2 miles to the park, a right turn. The observing site is through the gate and roughly 100 yards beyond. Card-carrying MAS members may observe at Baylor at any time; call the park keepers in advance at 448-6082.

Cherry Grove

Cherry Grove is about 20 miles south of Cannon Falls. Head south on Hwy 52. Around 6 miles south of Cannon Falls, take a right onto Goodhue County 1 and follow it around 16 miles, where it ends in a T with Dodge County A. The observatory and warming house are at your right, nestled in the corner of the T.

1999 star parties			
Date	Site	Moon	Sunset
12/10	Baylor	Sets 19:02 CST	16:32 CST

Star parties are held on Friday if weather permits, otherwise on Saturday. Call (612) 649-4861 after 6:00 PM on a star party date to hear whether it will be held.

lunar calendar

	New	FQ	Full	LQ
November	7	15	23	30
December	7	15	22	29
January	6	14	22	28

Public Lecture

On Thursday, Dec. 2 at 7:30 p.m., U of Mn astronomy professor Roberta Humphreys will be speaking as part of a lecture series organized in conjunction with a current exhibit at the U of Mn's Weisman Museum, "World Views: Maps and Art." Professor Humphrey's talk is entitled, "Mapping the Night Sky: From the Solar System to the Universe," and will trace the human endeavor to chart the heavens from ancient Egypt to the present, ending with Humphrey's presentation of her own current work on celestial structure. The lecture is free and open to the public. The Weisman phone number is 612-625-9494.

From the Bookshelf

Here are two "must have" annual manuals. An entire year's review of events astronomical in addition to product reviews, new scopes, new books and software, and resources for this new year. **On newsstands now!!**

From Sky and Telescope: "**Skywatch 2000**".

By: Sky Publishing. \$5.99

From Astronomy magazine: "**Explore the Universe**"

By: Kalmbach Publishing \$5.95

Aurora

Find out if you will see the Northern Lights tonight! To get the forecast for auroral activity (the Northern Lights) for the next 24 hours, call the Space Environmental Center at: (303) 497-3235. The recorded message is updated every day. **Listen for the "K Index"**. A K of 5 or higher means that aurora should be visible from the Twin Cities! You can also check it out on the Web @ www.sel.noaa.gov to get today's Space Weather. For more information, click on "Latest Space Weather" then "Auroral Activity Estimates".

Websites

Looking for a great astronomy web site but tired of spending all your time crunching through search engines? We've got a great solution for you. Griffith Observatory in Los Angeles has a list of top quality sites - sites that they've given their "Star Award" for excellence. You can go to this page and read the descriptions to find a site that suites you. All of these sites are excellent - that's why they are listed here: <http://www.griffithobs.org/StarAward.html>.

how to pay your dues

Your MAS membership expires at the beginning of the month shown on your Gemini mailing label and your membership card. Send your payments to the MAS treasurer (Bill Glass) at 5721 York Ave. South, Edina, MN 55410. Make checks payable to MAS. The current annual membership dues and subscription fees are:

Regular membership	\$ 16.00
Student membership	\$ 10.00
Subscription to Gemini for members of other astronomy clubs	\$ 4.50
Subscription to Gemini for other persons	\$ 9.00

To Renew Your Sky and Telescope Subscription

If you get *Sky and Telescope* at the club's discounted rate, you must renew your subscription through the club. When you get a renewal notice from S&T, send the notice along with a check for the amount indicated on the notice (currently \$29.95) to the MAS Treasurer (William Glass). Make checks payable to MAS. If desired, you may renew your MAS membership at the same time, and write one check to cover both payments.

GEMINI

MN ASTRONOMICAL SOCIETY

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To subscribe to the MAS e-mail list send e-mail to:
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The list has about 40% of the membership on it.

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